Energy Smart Pools

Current Situation

- Americans are Currently Spending $3.5 Billion / Year to Heat Pools
- The Public Sector Accounts for over $1 Billion of the Total
- A Savings of Over 50% is Achievable with Currently Available Technology

Heated Pools in U.S.

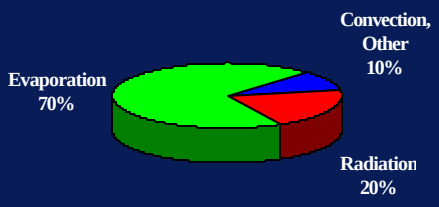
- Public Pools 145,000
- Semi-Public Pools 170,000
- Residential 2,815,000

Average Monthly Heating Costs

City	Outdoor	Indoor
Denver	$310	$350
Boston	$380	$590
Los Angeles	$480	$330

Based on a 1000 sqft pool heated to 80° with natural gas

Understanding Pool Energy Loss



Evaporating Water Requires A Large Amount of Energy

Heat One Pound of Water From 50° to 80° 30 BTUs

Evaporate One Pound of Water at 80° 1048 BTUs

What's the Answer to Evaporation?

Pool Covers!

Types of Cover Materials

- Bubble / Solar Covers
- Vinyl Covers
- Insulated Covers

Methods of Use

- Manual
- Semi-Automatic
- Automatic

- Portable Reels
- Fixed Reels
- Tracks

Other Advantages

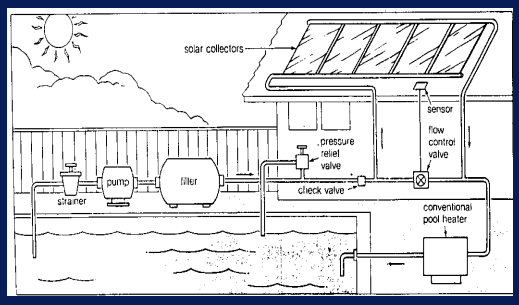
- Reduces Make-Up Water by 30-50%
- Reduces Chemical Consumption 30-50%
- Prevents Dirt & Other Debris from Getting into Pool

Solar Pool Heating Systems

Why Solar for Pools?

- Best use of Solar is to Heat Swimming Pools
  - Low Temperature Heat Required
  - Lower Cost Collectors can be Used
- Solar Energy is a Renewable Domestic Resource
- Makes Pool Heating Affordable
- Can Extend Swimming Season

Solar Pool Heating System



Types of Collectors

- Unglazed
- Glazed

Collector Siting

- Collectors should be Sited to Receive Unobstructed Sunlight from 8am - 4pm
- Residential Needs 200-700 sqft of Open Roof or Ground
- Commercial Needs up to 3000 sqft of Open Roof or Ground

Collector Orientation

- Ideally Collectors should face Due South
- But 15^{o} East or West of South Will Do

Collector Tilt

- Summer Only - Latitude minus 10-15 degrees
- Winter Only - Latitude plus 10-15 degrees
- Year Around - Latitude

Collector Sizing

- Pool Size & Desired Temperature
- Available Solar Insolation
- Average Temperatures & Windspeed
- Collector Orientation & Tilt

Wind Breaks

7 mph Wind Can Increase Consumption Over 300%

Wind Breaks

- Trees - But Avoid Pool Shading
- Shrubs
- Fences

Energy Efficient Pumps

- Motors Can Consume Several Times Their Initial Cost Each Year
- Proper Sizing is Critical to Efficient Operation
- Energy Efficient Motors Can Pay for Themselves in a Very Short Time
- A Small Increase in Efficiency Yields Large Savings

Energy Efficient Lighting

- Compact Fluorescents Save 1/2 - 2/3 the Electricity and Last 10 Times as Long and Incandescent Lamps
- Electronic Ballasts and T-8 Lamps Save 1/3 Compared to Standard Fluorescents
- High Intensity Discharge (HID) Lamps Offer High Efficiency and High Illumination (Large Pool Rooms & Outdoor Lighting)
- Motion Detectors (Shower Rooms/Changing Areas, Offices)

Shower Savings

- Set Temperature at 95-110^{o}
- Install Low-Flow Showerheads
- Insulate Water Heater
- Install Auto-Shut Off Valves

General Pool Energy Management

- Pool Temperature - Each Degree Increase in Temperature Ups Consumption 10%
- Keep Intake Grates Clean
- Reduce Filtration Time
- Don't Backwash Filter More Frequently than Necessary
- Keep Pool Heater Tuned Up

Summary

- Implement the Low-Cost/No-Cost Ideas First
- Install a Pool Cover
- Investigate a Solar Pool Heating System

Energy Smart Pools

U.S. Department of Energy